



MATH IN THE REAL WORLD

Subject Matter: Mathematics

Grade Levels: 3-5, but may be adapted to other grade levels

Time Allotment: Two 45-minute class sessions

Master Teacher: Christine Barr

Overview

How does the real world relate to math? Through activities presented in this lesson, students will gain an understanding of how math is used in real-life situations. Students will use the think, plan, try and check strategy, and use algebraic reasoning to figure out the best method of problem solving.

Learning Objectives

Students will be able to:

- Use the think, plan, try and check strategy to solve problems.
- Use algebraic reasoning to figure out the best method of problem solving.

Oregon Standards Available at:

<http://www.ode.state.or.us/cifs>

Mathematics - Calculations and Estimations

- Estimate solutions to problems and determine if the solutions are accurate and reasonable.

Mathematics - Algebraic Relationships

- Represent and describe relationships among quantities using words, tables, graphs and rules.

Mathematics - Mathematical Problem Solving

- Use pictures, models, diagrams and symbols to show main mathematical concepts in the problem.

Media Components

Video

Check the link at <http://www.opb.org/edmedia/trs/> to find access to the video(s) from unitedstreaming™ referenced in this lesson plan.

- “Mathematical Eye: Working Things Out” (20:26)

Web

- **Family Education Network - Piggy Bank**
This site offers an interactive game where students calculate the amount of change they should receive.
<http://www.funbrain.com/cashreg/>
- **Family Education Network - Math Baseball**
This site offers an interactive game where students must figure out math equations to proceed around a baseball diamond.
<http://www.funbrain.com/math/>
- **Escape From Knab**
This is an interactive game where students must use real-life math to “escape from the planet Knab.” Students need to figure out how to earn enough money to return to Earth. Students are faced with issues such as employment, taxes and living expenses.
<http://www.escapefromknab.com/index.html>

Materials

For Each Student:

- 2 sheets of notebook paper
- Pencil

For the Teacher:

- 3 different pairs of socks (they need to be different colors)
- Play money
- Fruit and scale for weighing
- Grocery advertisements
- Employment classifieds

Prep for Teachers

Prior to teaching this lesson, bookmark all the Web sites used in the lesson on each computer in your classroom.

Download the video onto the computer you will use to project the video for the classroom presentation. (Be aware that the narrator in the video sounds American, however, the video was produced in the United Kingdom. There will be English terms, such as grams, and English currency and stamps, such as 50p coins.) Be certain each computer in the classroom has a copy of the free Windows Media Player installed (some clips aren't available for use with QuickTime Player).

When using media, provide students with a **Focus for Media Interaction**, a specific task to complete and/or information to identify during or after viewing of video segments, Web sites or other multimedia elements.

Introductory Activity

Step 1: Ask students how they have used math outside of school. (Answers will vary, but they should mention using money and telling time.) Discuss with the students other ways in which math is used in everyday life (cooking, building things, scientific experiments, shopping, following schedules, etc.).

Step 2: Ask students how they might use math when getting ready for school in the morning. (Answers will vary, but students may mention scheduling enough time to get ready, making sure they have enough money to buy lunch, etc.)

Step 3: Tell students that they might need to use math when getting dressed. Ask the students how they would get a matching pair of socks out of the drawer in the dark when they have three different-colored socks in the drawer. (Student answers will vary.) Place the three different pairs of socks on the table. Have students volunteer to come up and try to pick out a match with their eyes closed. Ask students how many socks they would need to pick up to be certain they had a matched pair. (Students should realize they need to pick up four socks to be sure they have one match.) Explain to the students that they are using math to figure out how to get a matching pair - they are problem solving. Tell the students that in this lesson they will learn some problem-solving strategies for math in the real world.

Learning Activities

Step 1: Explain to the students that they will be learning some real-world problem-solving strategies by watching a video clip. Provide students with a **Focus for Media Interaction**, asking them to watch for how the materials supervisor in the video uses math. **Play** the video, "Mathematical Eye: Working Things Out" (20:06).

Pause the video at approximately 01:22 when you hear, "... How do you think she figures out how many bricks have been used in this wall?" Discuss with the students how the materials supervisor might figure out the number of bricks. (Answers will vary, but students may say she counts the bricks, she measures an area then counts the bricks in that area, etc.) **Resume** the video.

Pause the video at approximately 01:49 when you hear, "... How are these measurements going to help?" Discuss with the students how the measurements might help the materials supervisor. (She can count the bricks in the area, determine the total area of the wall and figure out how many bricks were used.) **Resume** the video.

Pause the video at approximately 02:35 when you hear, "... How can you find out how many bricks there are in 1 square meter?" Discuss with the students how the materials supervisor could figure out the number of bricks. (She could count each brick, she could count the number of bricks used for the length and height and multiply to find the number of bricks in the area.) **Resume** the video.

Pause the video at approximately 03:34 when you hear, "... check the best values in the supermarket." Discuss with the students how the materials supervisor used math. (She figured out what supplies were needed, checked to make certain she had enough supplies and figured out what to do with rotten supplies.) Provide students with a **Focus for Media Interaction**, asking them to watch for how the girls figured out the best value in the supermarket. **Resume** the video.

Pause the video at approximately 05:20 when you hear, "... Wouldn't you expect to get the best value from the largest container?" Discuss with the students the strategy the girls used. (They checked the weight of the cans and divided the weight by the price.) Provide students with a **Focus for Media Interaction**, asking them to watch for how people use math in the real world to figure out missing information. **Resume** the video.

Pause the video at approximately 09:52 when you hear, "... It's a good thing they learned subtraction in school." Discuss with the students some of the missing information that was needed in this section of the video (how many apples in one pound, how many days a week the restaurant was open, what bus you should catch to make it home on time, when and where to launch rockets to put people on the moon and get them home safely again). Provide students with a **Focus for Media Interaction**, asking them to watch for how the students in the video use the think, plan, try and check strategy to solve real-world math problems. **Resume** the video.

Pause the video at approximately 17:02 when you hear, "... Could you do better?" Discuss with the students the ways that the think, plan, try and check strategy was used in the video (figuring the correct postage, amount of change, building a car that goes 100 miles on one gallon of fuel). Provide students with a **Focus for Media Interaction**, asking them to watch for more ways the students in the video use the think, plan, try and check strategy to solve real-world math problems. **Resume** the video.

When the video has ended, discuss the final ways the students in the video used the think, plan, try and check strategy (matching socks, matching gloves, putting even numbers of bottles in rows and columns).

Step 2: Tell students that they are going to practice using the think, plan, try and check strategy with some interactive Web sites. Provide students with a **Focus for Media Interaction** by asking them to use the think, plan, try and check strategy when calculating correct change. Have students log on to the Family Education Network - Piggy Bank Activity at <http://www.funbrain.com/cashreg/>. Allow the students to have 10 minutes on this Web site to practice using the think, plan, try and check strategy when calculating correct change.

Step 3: Have students log on to the Family Education Network - Math Baseball Activity at <http://www.funbrain.com/math/>. Provide students with a **Focus for Media Interaction** by telling them that they will use the think, plan, try and check strategy on this site to figure out math equations. Allow the students to have 10 minutes on this Web site to practice using the think, plan, try and check strategy.

Culminating Activity

Step 1: Review with the students how the think, plan, try and check strategy can help solve real-world math problems. (It can help at work, in the store, counting change, when figuring out missing information, etc.)

Step 2: Provide students with a **Focus for Media Interaction** by telling them that they are going to be involved in a real-world simulation where they must use math skills in everyday living. Have students log on to the Escape From Knab Web site at <http://www.escapefromknab.com/index.html>. Students will begin the simulation by clicking on the “land on Knab” button at the bottom of the page. The students will be directed to a page that introduces the simulation: the students have won a one-way ticket to Knab; they need to earn \$10,000 to return to Earth. They must earn and save enough money on the planet Knab so they can buy a return ticket. After reading the introduction, students will click on the “Blast Off!” button at the top of the page to continue the simulation. Students will be asked to choose a job, fill out a W-4 form, figure out a monthly budget and choose investments. Each choice the students make helps to take them through the simulation. Their monthly statement will be displayed on a sidebar, so students can see how their decisions relate to their financial situation. Tell students they must keep a log of how they used math to escape from Knab. Instruct students to write their log on notebook paper, explaining the various ways they used math.

Step 3: When students have completed the Escape From Knab Activity, have them write and solve math problems that they might find in the real world. (Use this assignment as an assessment.) Tell the students to use the manipulative items you have provided (socks, play money, fruit/scale, grocery advertisements, employment classifieds) to check their work. The problems should include:

- 3 problems that calculate correct change
- 3 problems that calculate price per weight
- 3 problems that calculate wages per hour
- 1 problem that calculates data of choice

Cross-Curricular Extensions

Language Arts/Writing

- Have students write journal entries, using creative writing to describe their experience on the planet Knab.

Science

- Use the think, plan, try and check strategy in a scientific inquiry lesson.

Social Studies

- Have students use a timeline and calculate how many years have passed between historic events and present time.

Community Connections

- Have students check grocery store advertisements and calculate the savings of items based on weight.
- Invite a construction company project manager to speak to the class about ways they figure the costs of buildings.
- Weigh various packages and have students calculate the correct postage stamps needed to send the packages via U.S. mail.